

REMARKS

Amendments have been made to the claims for consistency. The word "image" has replaced "design" as better indicative of the breadth intended for the claims. Certain claims have been amended to call for this preferred printing with dye.

Applicants appreciate the Examiner's evident care in examining the application. The forthrightness as to what the references do and do not teach has been helpful and is appreciated.

However, for reasons to be explained, Applicants respectfully disagree with the ultimate conclusion reached by the Examiner. The following will explain why Applicants believe the record is persuasive that claim 1 as amended is an invention... unobvious and patentable over the cited references.

Claim 1 concerns the realization and discovery that ultra-thin hook-engageable non-wovens (i.e. hook-engageable non-wovens having basis weight less than about 4 ounces per square yard) can usefully be printed with all or part of a graphic image, and, as laminated to a supporting substrate, is a useful product. (An illustration is the novel lamination as part of a corrugated paperboard arrangement that forms the attractive or informative feature of a point of purchase display.)

As is well known, a hook-engageable loop material has important characteristics. On its working face it has upstanding loops of fibers that are sufficiently exposed as to be engageable by hooks of a matching fastener component; further, characteristically, in order to serve as a fastener component, the fibers constituting the "loops" are bound to the ground or body of the fabric with what is typically called a binder to secure the fibers against pull-out. Classically, to serve as an effective fastener component, hook-engageable materials have been constructed with substantial mass and strength, such as pile fabrics or cloth. It was a rather remarkable accomplishment that an ultra-thin material had been developed that can function as an effective hook-engageable loop material for fastening.

Applicant Shepard and his co-worker, Applicant Provost, at Velcro, before making the present invention, were well aware indeed of the existence of such ultra-thin hook-engageable loop material, per se... as it was Mr. Shepard, himself, who, with Mr. Ericson, invented the successful ultra-thin material subject of Shepard et al WO 99/11452, upon which the Examiner

has relied. But the disclosure of that published application along with its parent U.S. Patent 6,342,285, will be searched in vain for teaching of printability of the present invention.

This absence is most significant, considering the background of Mr. Shepard (and Mr. Provost, addressed later).

Mr. Shepard is a packaging professional with many years' experience in printing and in the physical characteristics of packaging and presentation materials per se. Further, as an employee of Velcro, he was intimately familiar with conventional hook and loop materials, the main-stay products of Velcro USA. He was, as well, aware that visual images have been printed on conventional, relatively heavy pile loop fabrics and cloths (typically by rotary screen printing, using heavy viscous inks required by the characteristics of the material).

Mr. Shepard's interest in visual properties in the ultra-thin loop material was reflected in the cited Shepard et al. reference by his observation, page 14, line 24, "In between knots, the thin fiber mat is not very dense and is sheer enough to permit images to be readily seen through it," this material having "ultra-thin ground portion 16...", page 19, line 4.

The examiner suggested that the invention of claim 1 would immediately be obvious to a person with such background knowledge as Mr. Shepard possessed. For instance "It would have been obvious to one having ordinary skill... to substitute the non-woven loop material taught by Shepard et al for the loop material used in the display system taught by Nemec et al" page 5, and [because graphic images have previously been applied to conventional hook-engageable pile or cloth fabrics by screen printing, taught by other references cited by the Examiner] "it would have been obvious.... to apply a graphic image to the loop material on the display ...taught by Nemec et al," Examiner's page 6.

The truth of the matter, however, is that ultra-thin non-woven loop material is unconventional. It is remarkably different from conventional hook-engageable piles or cloth because of its extreme light weight and openness. Assumptions underlying the examiner's position that printing a graphic image upon it would have been obvious are unwarranted. No conventional material, for instance, was so "very thin (as evidenced by the scale of the photographs) [Figs. 1, 2, 2A]" of the Shepard et al cited reference, page 13, l. 12, 13, such that "In between knots, the thin fiber mat is not very dense and is sheer enough to permit images to be readily seen through it", pg. 14, lines 2-4.

Applicant : William H. Shepard et al.
Serial No. : 09/322,663
Filed : May 28, 1999
Page : 6

Attorney's Docket No.: 05918-133001 / VGCP 4100

How, other than because of the unconventionality of the ultra-thin material, can one explain that Mr. Shepard, deeply experienced in printing, made no mention of printability in the cited reference? He and Mr. Ericson were evidently interested in listing all possible uses of their new ultra-thin, hook-engageable material, but made no mention of its printability.

Note in the cited Shepard et al reference, while not mentioning printability, they did observe it's usefulness, per se, on bags and displays, and went on to detailed description of products using it, ranging from patches on boxes, diapers, and surgical gowns, to air filters, see original Figs. 7. Such thoroughness of examples evidence Mr. Shepard's and Mr. Ericson's motivation to mention everything they had conceived.

The fact is that, despite his printing background, and that he did examine the material for a visual effect, still at the time of filing the cited original patent application, Mr. Shepard did not possess the present invention. The reason for this concerns his above quoted observations of the physical openness properties of the material. He did not assume, and one should not assume, that what could be done with conventional, relatively thick and dense piles and cloths concerning printing, could also be done with very different, ultra-thin open materials. (Conventional loop fabrics, e.g. pile, are printed by rotary screen printing using the viscous inks, whereas the present invention achieved its reported best success with printing using a different material, dyes, not viscous screen printing inks. See the specification.)

It wasn't until after Mr. Shepard and his present coinventor, Mr. Provost (a long-time employee and inventor of Velcro) thought to try printing, that they discovered that selected printing techniques, surprisingly, resulted in such quality that they concluded a printed ultra-thin hook-engageable loop non-woven article was useful, and worthy of description in a patent, dye printing in preferred cases, directly on the hook-engageable loops, not hindering their hook-engageability.

We submit, therefore, that the Shepard et al cited reference, properly understood against its background, is in fact evidence of patentability.

The Examiner, however, need not make the decision of unobviousness on this explanation alone. There is strong corroborative evidence in the record as well.

We refer to cited Lawless, U.S. 5,891,547. Ms. Lawless also set out to achieve an ultra-thin hook-engageable loop non-woven material. Whereas her approach placed binder in the

hook and loop entanglement zone, which makes Applicants question the practical utility of the material as a hook-engageable fastener, Ms. Lawless reports some promise in this regard, in a fabric that also had a basis weight within the present claim.

Her evaluation of the material, reported at col. 4 of the cited Lawless reference, was "Fiber characteristics... influence the fabric's transparency... A clear loop component may add marketability... by allowing the consumer to see a printed film placed beneath the loop component." col. 4, lines 42-50, emphasis ours.

From this, it is apparent that Ms. Lawless had an interest in analyzing her ultra-thin product for visual marketing possibilities. Consider the significance of her focus in light of the present Examiner's accurate observation, that "Lawless fails to teach applying [sic, printing] a graphic image on the fabric itself," present office action, page 9, line 6 from bottom.

Ms. Lawless, of well regarded Precision Fabrics Group Inc., evidenced her familiarity with conventional loop fabric materials at col. 1, lines 45-50 of the cited Lawless reference. It is reasonable that she, e.g. by her association with Precision Fabrics, was well aware that conventional relatively heavy weight pile fabrics and cloth are printable. Against this background, the fact that Ms. "Lawless fails to teach.... [printing] a graphic image" upon the material she developed, is evidence that, despite her manifested interest in reporting visual effects and marketing concerns, she did not find obvious the inventive concept of present claim 1. Ms. Lawless' disclosure is therefore evidence in corroboration of unobviousness.

We proceed now to see whether any of the other cited references changes this picture.

Nemec et al, U.S. 6,010,387 discloses a display panel in which one of its coverings over corrugated polymeric board is a "hook or loop material." The Examiner also noted, p. 8 "Nemec fails to teach applying [sic, printing] a graphic image". The Examiner was correct, also, that "Nemec et al fails to teach the specific structure of the loop material applied to the display system." We will further refer to Nemec et al in respect of claims 18-20. Certainly Nemec adds nothing in respect of present claim 1.

Lemelson et al., U.S. 3,857,566 mounts a pile material 17 that has been brushed to form hook-like formations. Therefore it is a hook material not a loop material. The material stretches across an open frame as a free span, much in the nature of a drum head. "[T]he material is thus maintained by the frame a distance D away from... the rear face", col. 2, lines 37,38, so that "it

may be substantially deformed... when a missile 22 [a dart] strikes...", col. 2, lines 45-47]. To usefully withstand repeated impact of darts, one can be sure the nylon pile of Lemelson was not "less than about 4 ounces per square yard" nor anywhere near being an ultra-thin hook-engageable material. Neither was Lemelson's pile, a "laminate"; his teaching was directly away from being so. Printing of lines, numbers and illustrations on Lemelson's relatively heavy pile, though "graphic images" in the sense used here, was not at all suggestive of the invention of present claim 1, which calls for a laminate, and a non-woven material having hook-engageable loops of material having non-woven hook-engageable loops of basis weight of less than 4 ounces per square yard. Lemelson does not make up for the deficiencies of Shepard et al, Lawless, or Nemec.

Powell, U.S. 5,603,504 teaches a hook-engageable target formed by cloth 20 mounted on a wall by pins 16. Indicia are painted or silk screened on the cloth. There is no fair teaching of printing a hook-engageable non-woven of basis weight less than about 4 ounces per square yard, in conjunction with a supporting substrate as a laminate. Powell adds nothing over the other references discussed in regard to claim 1.

Bricker, U.S. 5,664,780 has a display board on which an image is painted or silk screen printed and uses magnetism attraction for applying tokens to the board. Apparently the Examiner considers this reference relevant because of the statement, col.5 line 33 et seq "Even though the preferred means of display board 10 to token 30 and 35 interaction is by magnetism, other attractive means such as VELCRO [sic brand] type loop-to-hook interactions, electrostatic interactions, frictional interaction, snap or hook mechanisms, tab and slot interactions and equivalent processes are within the realm of this disclosure." It is not clear from its disclosure that this reference concerns a laminate, or whether the hook or loop material is to be the surface that is painted or printed, hence it fails as a teaching for that reason alone. But in any event, being filed in 1995, clearly its reference to "Velcro" brand materials could only be reference to conventional loop materials offered by Velcro at that time, which assuredly were not ultra-thin loop materials to which the present claim is directed.

In summary, from all of the cited references, it seems the most that can be said is that (1) ultra-thin hook-engageable loop materials, per se, having considerable openness so as to be transparent, were in the prior art but their practical printability had not been recognized, (2) silk

screen printing typically with heavy, viscous inks, on conventional weight, much heavier, hook-engageable pile or cloth was in the prior art, alone, or with the fabric on the face of a board, and (3) laminates of conventional relatively heavy loop material or corrugated polymeric board were known.

We submit that present claim 1 is patentable over such prior art, for reasons given. It would be impermissible hindsight to say that the invention of claim 1 was fairly taught by the cited references, alone or in any proper combination.

For the first combination cited by the Examiner, substitution of Shepard et al's ultra-thin non-woven in Nemec et al's laminate, would not make a printed image on the ultra-thin, open hook-engageable material obvious, as none of the other references teaches that.

For the Examiner's second combination, substituting Lawless for Shepard et al., the same reasoning pertains.

For the Examiner's third combination, starting with Lawless, the same deficiency in the cited prior art remains.

Repeating what has been said earlier, the Examiner noted Ms. Lawless had observed the transparency of her loop material, and its ability to transmit images for marketing from an underlying printed film. She was thus well aware of appearance considerations, but she failed to suggest printing directly on on such non-wovens themselves nor to support the non-woven as a laminate. The Lawless reference is evidence of the unobviousness of the concept of claim 1.

We submit, that no matter how one slices it, the concept of claim 1 has not been fairly suggested by any of the references alone or in any proper combination of their techniques.

Claim 1 is submitted to be unobvious over the references of record and patentable.

All further claims under examination in this application are dependent on claim 1 and submitted to be patentable because claim 1 is patentable. Furthermore, the dependent claims bring out further important features in characterizing novel relationships that further define invention, i.e.:

Claim 2 brings out that an even lighter weight ultra-thin hook-engageable material can be printed.

Claim 3 characterizes a high percentage of binder in the fiber-based material that distinguishes Lawless, whose fabric had only a small percentage (maximum 10%) of binder; this

limitation, further, draws attention to an important difference from conventional loop materials as well.

Claim 4 characterizes the stretched, stabilized character of the preferred class of non-woven material, while newly added claim 38 brings out the preferred two directional stretch that further distinguishes Lawless.

Claim 6 requires the non-woven material to have substantially varied areal density, while an amendment brings out the novelty of practical, useful printing over the area of the varying density.

Claim 7 requires variation in fiber density by a remarkable factor of four, over which the image is printed, again distinguishing Lawless as well as conventional loop material.

Claim 11 requires the printing to be on the side of the thin material from which the hook-engageable yarns or loops of this thin material extend, i.e. the exposed side, a very different situation from Lawless who would depend upon printing on a separate film lying beneath the ultra-thin material. The claim is further limited, by amendment, to dye printing, a type of printing not ordinarily used to print pile or cloth fabrics, and not suggested by the cited references, see also new claim 37.

Claim 13 brings out that the dye printing is partially on the actual hook-engageable fibers or yarns themselves, and see comments regarding claim 11. Whereas this printing does not impair the hook-engageability of the loops, rather typically, screen printing of relatively thick, viscous ink, was known to harm or eliminate hook-engageability of loops of conventional pile or cloth fabric, and certainly would, if used, obliterate hook-engageability of the loops of the ultra-thin non-wovens.

Claim 14 brings out that the dye printing is partially on the outer surface of the web body, see comments regarding claim 11.

Claim 15 brings out the particular novelty of printing being on the laminated side of the thin loop material, again distinguishing Lawless who requires the separate film beneath the non-woven..

Claim 16 brings out novel composite images in which printing on the substrate cooperates with the novel printing on the ultra-thin material itself, something the Lawless reference clearly did not suggest.

Claim 17, as amended deserves particular emphasis. The claim calls for the substrate, to which the thin printed hook-engageable material is laminated be a smooth paper sheet. Such a hook-engageable laminate, besides having materials cost advantage, is, as illustrated in the figures, capable of being further processed by standard paper converting equipment that is low cost to operate. Such a product, with a pleasing or informative printed graphic image, and cost saving of the ultra-thin non-woven loop material, coupled with cost savings of paper as the laminated substrate material, coupled with cost savings in further processing such a paper laminate, establishes an important decorative and informative product, that is not fairly suggested by any of the cited references. See also new claim 35.

Claim 18 is novel in that an ultra-thin, hook-engageable material (basis weight less than 4 ounces per yard) is found to have utility as an image-bearing component of a corrugated product. Nemec lacks this teaching.

Claim 19 as amended calls for the thin hook-engageable non-woven to be laminated over a smooth paper-sheet side of corrugated paperboard; Nemec's relatively expensive corrugated polymeric board does not suggest this low-cost paper/non-woven composite product.

By the concept of claim 20, amended, it is found practical to have such a thin hook-engageable material itself act alone as a side of corrugated board, being laminated directly to the flutes of the corrugated core. Nemec et al. has no such teaching.

Claim 21, listing a group of useful materials for the substrate, shows the versatility of the concept (albeit paper substrates, in many instances previously mentioned, provide particularly unique advantages).

Accordingly, the dependent claims are submitted to be unobvious and patentable in their own right.

Attached is a marked-up version of the changes being made by the current amendment.

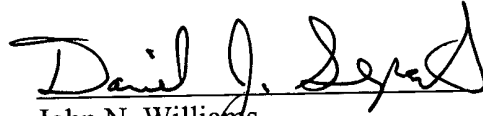
Applicant : William H. Shepard et al.
Serial No. : 09/322,663
Filed : May 28, 1999
Page : 12

Attorney's Docket No.: 05918-133001 / VGCP 4100

Applicant asks that all claims be allowed. Enclosed is a \$400 check for the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: April 8, 2002

 Reg. No.
45,388
John N. Williams
Reg. No. 18,948

Fish & Richardson P.C.
225 Franklin Street
Boston, Massachusetts 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

20415699.doc

Version with markings to show changes made

In the claims:

Claim 12 has been cancelled.

Claims 1, 4, 6, 7, 9 11, 13-17, 19 and 20 have been amended as follows:

1. (Twice Amended) A laminate comprising
a substrate having at least one broad surface, and
a layer of hook-engageable non-woven material having a basis weight of less than
about 4 ounces per square yard and comprising a [generally] sheet-form web body having a first
surface laminated to said at least one outer broad surface of the substrate and a second surface
from which hook-engageable fibers or yarns extend; and
a graphic [design] image printed at least partially upon the non-woven material.

4. (Amended) The laminate of claim 1 wherein said hook-engageable material
comprises a stretched material, stabilized in its stretched condition.

6. (Amended) The laminate of claim 1 wherein the non-woven material has
substantially varied areal density of fibers over its surface, the printed graphic image extending
over areas of said substantially varied fiber density.

7. (Amended) The laminate of claim 6 wherein said non-woven material
comprises areas with relatively high areal density of fibers interspersed with areas with relatively
low areal density of fibers, the [ratio of high to low areal densities being at least four to one]
density of fibers in areas of highest areal density being greater by a factor of at least four from
the density of fibers in areas of lowest areal density, the printed graphic image extending over
areas of highest and lowest areal density of fibers.

9. (Amended) The laminate of claim 1 wherein the graphic [design] image is disposed to be visible by viewing said second surface of the web body from which the hook-engageable fibers or yarns extend.

11. (Amended) The laminate of claim 1 wherein said graphic [design] image comprises an image printed with dye on the second side of the non-woven material, from which the hook-engageable fibers or yarns extend, wherein an image visible from the surface of the non-woven material is comprise[s]d [the] of [effects of] light reflected by printing on said second surface of the non-woven material and light reflected by printing on said hook-engageable fibers or yarns.

13. (Amended) The laminate of claim 9 wherein said graphic [design] image at least partially comprises dye printing residing on said hook-engageable fibers or yarns of the non-woven material.

14. (Amended) The laminate of claim 9 wherein said graphic [design] image at least partially comprises dye printing residing on the second surface of the web body from which the hook-engageable fibers or yarns extend.

15. (Amended) The laminate of claim 9 wherein said graphic [design] image at least partially comprises printing residing on said first surface of the web body, the non-woven material being at least partially transparent such that the image [design] can be seen through the non-woven material.

16. (Amended) The laminate of claim 9 wherein said at least one outer broad surface of the substrate to which the non-woven material is laminated is continuous and said graphic [design] image is at least partially printed on said outer broad surface of the substrate, the non-woven material being at least partially transparent so that the image [design] can be seen through the non-woven material.

Applicant : William H. Shepard et al.
Serial No. : 09/322,663
Filed : May 28, 1999
Page : 15

Attorney's Docket No.: 05918-133001 / VGCP 4100

17. (Amended) The laminate of claim 1 [comprising a disposable sheet] in which said substrate comprises a smooth paper sheet.

19. (Amended) The laminate of claim [18] 1 in which the substrate comprises a smooth paper sheet side of a corrugated paperboard.

20. (Amended) The laminate of claim [18] 1 in which the substrate comprises a corrugated core laminated at its spaced apart flute regions directly to said hook-engageable material.